RC5 Remote Control

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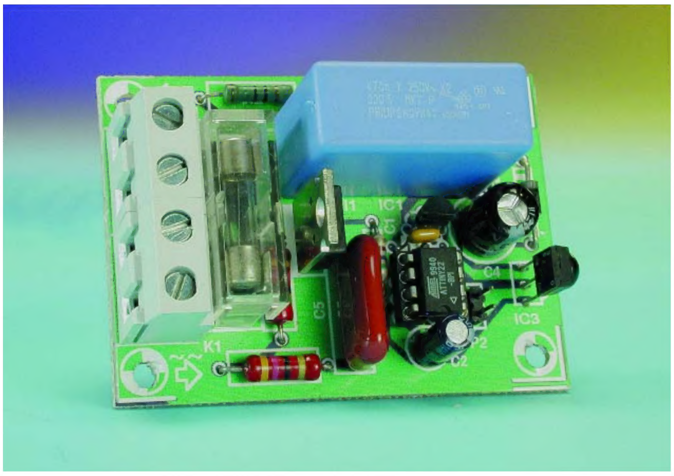


J. van Boxtel

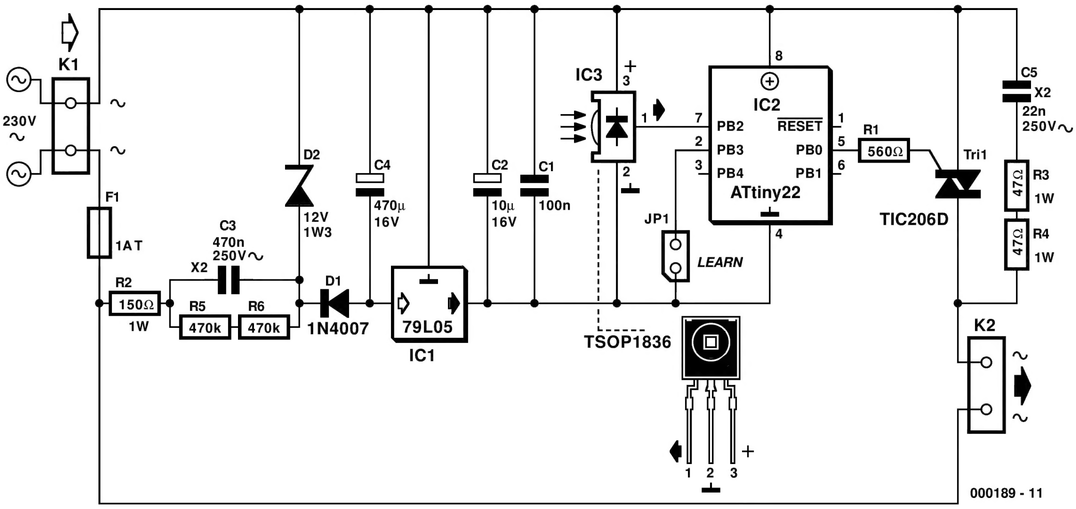
This circuit has been designed to switch lights and other loads on and off, using any RC5-compatible remote control. The receiver can be programmed to respond to any RC5-code, including the address (TV1, TV2, VCR1, etc.). The default address is ‘TV1 code 4’.

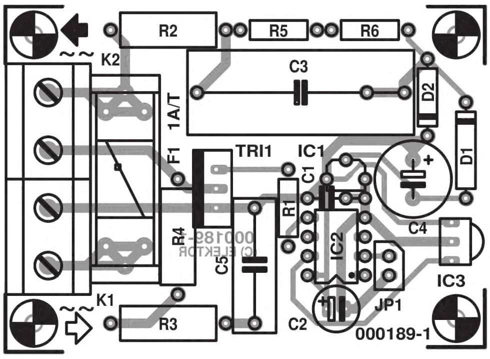
As can be seen from the circuit diagram, the circuit is very simple and consists of four main parts: an IR receiver module, a microcontroller, a triac driver and a supply section.

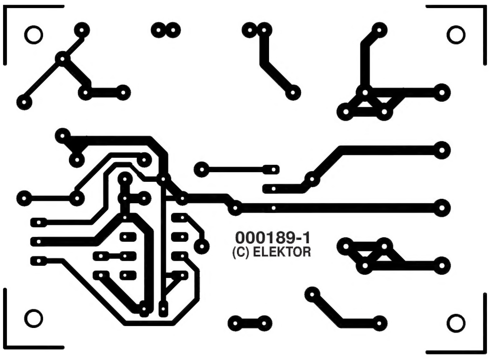
The supply for the circuit is derived directly from the mains, via C3, R2 and F1. The voltage is first pre-regulated to 12 V by zener D2, which is followed by voltage regulator IC1 to provide a perfectly regulated 5 V DC.

There is little more to be said about IC3 apart from that it is a standard IR receiver module, which is widely available (e.g., from Conrad Electronics). This module does not require any external components. The triac section will not require any explanation either, since it is a classic implementation of a solid-state relay.

At the heart of the circuit is IC2: a small 8-pin microcontroller from Atmel, which has been programmed to detect RC5 codes and to toggle the triac on or off when the correct code has been received. Space being limited we will not go into detail of the software here, but of course it is available from our website (www.elektor-electronics.co.uk) as a Free Download (ref. **000189-11**) and is also available on floppy disk. If you are unable to program the Atmel microcontroller yourself you can order a programmed chip







COMPONENTS LIST

Resistors:
R1 = 560Ω
R2 = 150Ω 1W
R3,R4 = 47Ω 1W
R5,R6 = 470kΩ

Capacitors:
C1 = 100nF ceramic
C2 = 10µF 16V radial
C3 = 470nF 250V_{AC} class X2
C4 = 470µF 16V radial
C5 = 22nF 250V_{AC}, class X2

Semiconductors:
D1 = 1N4007
D2 = zener diode 12V 1.3W
Tri1 = TIC206D
IC1 = 79L05
IC2 = ATtiny22L-8PC Atmel (programmed, order code **000189-41**)
IC3 = TSOP1836 (Vishay-Telefunken) (or Infineon SFH5110, Sharp IS1U60)

Miscellaneous:
JP1 = 2-way pinheader +with jumper
K1,K2 = 2-way PCB terminal block, lead pitch 7.5 mm
F1 = fuse 1AT (time lag) with PCB mount holder
Disk, source code files, order code **000189-11**

from *Elektor Electronics* (order code **000189-41**). Jumper JP1 is normally open. Closing this causes the last received code to be stored in the internal EEPROM memory as the new code that activates the receiver.

The use of the printed circuit board shown here will make construction of the circuit very straightforward. Remember to take great care during construction and testing, since the complete circuit is at mains potential!

Finally, we would like to point out that the circuit will only work with mainly resistive loads and is therefore unsuitable for fluorescent lights.

(000189-1)